Message

From: Thomas, Kent [thomas.kent@epa.gov]

Sent: 9/29/2016 5:26:44 PM

To: Korajkic, Asja [Korajkic.Asja@epa.gov]; McMinn, Brian [McMinn.Brian@epa.gov]; Guiseppi-Elie, Annette [Guiseppi-

Elie.Annette@epa.gov]

CC: Oshima, Kevin [Oshima.Kevin@epa.gov]; Behymer, Thomas [Behymer.Thomas@epa.gov]

Subject: RE: Update on sampling plants and fields.

OK, thanks Asja and Brian: The information we received from ATSDR is below; it looks like the POC will be a 2-step process, going to [EX. 6 Personal Privacy (PP)] first. From your email, I understand you will make the contact. (ATSDR is collecting samples at the [EX. 6 Personal Privacy (PP)] today, so I expect he understands what we are doing).

Thanks,

Kent

Also, per our phone call this morning, the contact person for **Ex. 6 Personal Privacy (PP)** - he will be able to coordinate all 3 site visits. His email is in the address bar above and his phone numbers are as follows:

Ex. 6 Personal Privacy (PP)

From: Korajkic, Asja

Sent: Thursday, September 29, 2016 1:15 PM

To: Thomas, Kent <thomas.kent@epa.gov>; McMinn, Brian <McMinn.Brian@epa.gov>; Guiseppi-Elie, Annette <Guiseppi-Elie.Annette@epa.gov>

Cc: Oshima, Kevin <Oshima.Kevin@epa.gov>; Behymer, Thomas <Behymer.Thomas@epa.gov>

Subject: RE: Update on sampling plants and fields.

Hi Kent,

We'll contact the POC at the recycling plant in as soon as we get the info. Depending on the travel/traffic, we're hoping to be there between 1:00 pm and 3:00 pm on Wed., 10/05.

Thanks,

Asja and Brian

Asja Korajkic, Ph.D. Microbiologist U.S. Environmental Protection A

U.S. Environmental Protection Agency Office of Research and Development

National Exposure Research Laboratory

26 W. Martin Luther King Dr.

Cincinnati, Ohio 45268

Ex. 6 Personal Privacy (PP)

From: Thomas, Kent

Sent: Thursday, September 29, 2016 1:08 PM

To: McMinn, Brian <McMinn.Brian@epa.gov>; Guiseppi-Elie, Annette <Guiseppi-Elie.Annette@epa.gov>; Korajkic, Asja

<Korajkic.Asja@epa.gov> Cc: Oshima, Kevin < Oshima. Kevin@epa.gov >; Behymer, Thomas < Behymer. Thomas@epa.gov > Subject: RE: Update on sampling plants and fields. Thanks, Brian. The samples from arrived in great shape and are already being processed into subsamples down in the lab today. Regarding the recycling plant in ____next week. Will you be contacting the POC for _____? What time would you prefer to collect samples at the recycling plant? Best wishes, Kent From: McMinn, Brian Sent: Thursday, September 29, 2016 12:34 PM To: Guiseppi-Elie, Annette <Guiseppi-Elie.Annette@epa.gov>; Korajkic, Asja <Korajkic.Asja@epa.gov> Cc: Oshima, Kevin <Oshima.Kevin@epa.gov>; Behymer, Thomas <Behymer.Thomas@epa.gov>; Thomas, Kent <thomas.kent@epa.gov> **Subject:** RE: Update on sampling plants and fields. Dear Annette and Kent, We had successfully completed sampling of the [Ex. 6 Personal Privacy (PP) blant and have travel arrangements booked for Ex. 6 Personal Privacy (PP) (Kent, we are staying at the same hotel as you, flying in 10/05 12:01 pm and flying out 10/06 5:15 pm). It sounds like we have written agreements for **Ex. 6 Personal Privacy (PP)** We would like to propose Wed. 10/12 8:00 am to 12:00 for [s. s Personal Privacy (PP)] sampling, and Thursday 8:00 am to 12:00 for [s. s Personal Privacy (PP)] sampling. If those times are satisfactory to the field operators, we can go ahead and make travel arrangements. You can send sampling kits to Cincinnati since we plan on driving to these locations. Window of 10/18 to 10/20 should work well for Ex. 6 Personal Privacy (PP) sampling. Thanks, Asja and Brian Brian R. McMinn Microbiologist U.S. Environmental Protection Agency Office of Research and Development 26 W. Martin Luther King Dr. Cincinnati, Ohio 45268 Ex. 6 Personal Privacy (PP)

From: Guiseppi-Elie, Annette

Sent: Wednesday, September 28, 2016 1:00 PM

To: Korajkic, Asja <Korajkic.Asja@epa.gov>; McMinn, Brian <McMinn.Brian@epa.gov>

Cc: Oshima, Kevin <Oshima.Kevin@epa.gov>; Behymer, Thomas <Behymer.Thomas@epa.gov>; Thomas, Kent

<thomas.kent@epa.gov>

Subject: Update on sampling plants and fields.

Dear Asja and Brian,

I now have a signed form for the plant in [
The contact is Exserental Privacy (PP) However, I have been working with signed and arrange for the visit. Her contact information is as follows: Ex. 6 Personal Privacy (PP)
She suggest the week of October 17 would be best and any day from Oct 18 – 20 would work. Let me know what work
for you and I will confirm with her.
Also, below is a summary of sampling as I currently understand it: Sampling by EPA (some of the selections for EPA were made because they potentially are within driving distance from Sept. 27 Sept. 28 Week of October 3 Week of October 3 TBD (Week of Oct 10?) TBD (Week of Oct 10?) TBD (Week of Oct 17?) TBD
Thanks, Annette.
From: Korajkic, Asja Sent: Tuesday, September 27, 2016 8:27 AM To: Thomas, Kent < thomas.kent@epa.gov>; McMinn, Brian < McMinn.Brian@epa.gov>; Guiseppi-Elie, Annette
< <u>Guiseppi-Elie.Annette@epa.gov</u> >, Guiseppi-Elie, Annette@epa.gov> Cc: Oshima, Kevin < <u>Oshima.Kevin@epa.gov</u> >; Behymer, Thomas < <u>Behymer.Thomas@epa.gov</u> > Subject: RE: TCRS - recycling plant sampling planning discussion
< <u>Guiseppi-Elie.Annette@epa.gov</u> > Cc: Oshima, Kevin < <u>Oshima.Kevin@epa.gov</u> >; Behymer, Thomas < <u>Behymer.Thomas@epa.gov</u> >
<guiseppi-elie.annette@epa.gov></guiseppi-elie.annette@epa.gov> Cc: Oshima, Kevin < Oshima.Kevin@epa.gov>; Behymer, Thomas < Behymer.Thomas@epa.gov> Subject: RE: TCRS - recycling plant sampling planning discussion
<a a="" href="mailto: <a href=" mailto:<=""> <a <="" href="mailto:
<guiseppi-elie.annette@epa.gov> Cc: Oshima, Kevin <oshima.kevin@epa.gov>; Behymer, Thomas <behymer.thomas@epa.gov> Subject: RE: TCRS - recycling plant sampling planning discussion Kent and Annette, We were wondering if you've heard back from the field owners in with the proposed sampling time and written approval? We just checked and the possible flights on 10/5 and 10/6 are quickly filling up. As a reminder, we were planning on sampling the plant between 1 pm and 4 pm on Wednesday 10/5, with field</behymer.thomas@epa.gov></oshima.kevin@epa.gov></guiseppi-elie.annette@epa.gov>

Asja Korajkic, Ph.D. Microbiologist U.S. Environmental Protection Agency Office of Research and Development National Exposure Research Laboratory 26 W. Martin Luther King Dr.

Cincinnati, Ohio 45268

Ex. 6 Personal Privacy (PP)

From: Thomas, Kent

Sent: Friday, September 23, 2016 3:22 PM

To: Korajkic, Asja < Korajkic.Asja@epa.gov; McMinn, Brian < McMinn, Brian@epa.gov; Guiseppi-Elie, Annette

< Guiseppi-Elie. Annette@epa.gov>

Cc: Oshima, Kevin < Oshima. Kevin@epa.gov >; Behymer, Thomas < Behymer. Thomas@epa.gov >

Subject: RE: TCRS - recycling plant sampling planning discussion

Yes, I think later in the day would be better. I am aiming towards a 5:30 pm flight out on Oct. 6.

But, if you can wait a bit before making a change, I would like to hear back that the field owners are OK with our proposed schedule. If they can't do the morning of October 6 we will need to make other changes.

Kent

From: Korajkic, Asja

Sent: Friday, September 23, 2016 3:09 PM

To: Thomas, Kent <thomas.kent@epa.gov>; McMinn, Brian <McMinn.Brian@epa.gov>; Guiseppi-Elie, Annette

<Guiseppi-Elie.Annette@epa.gov>

Cc: Oshima, Kevin < Oshima.Kevin@epa.gov >; Behymer, Thomas < Behymer.Thomas@epa.gov >

Subject: Re: TCRS - recycling plant sampling planning discussion

Hi Kent,

I had a quick question regarding 10/6 sampling event. We have an outbound flight leaving to 10:05 on the 6th. Do you think that'll give us a sufficient window to complete the sampling? If not, we'll find flights later in the day.

Thanks!

Asja and Brian

From: Thomas, Kent

Sent: Friday, September 23, 2016 1:29:38 PM

To: McMinn, Brian; Guiseppi-Elie, Annette; Korajkic, Asja

Cc: Oshima, Kevin; Behymer, Thomas

Subject: RE: TCRS - recycling plant sampling planning discussion

Thanks, Brian and Asja. We will propose these days and see if we can get agreements.

I will put in a travel request.

Kent

From: McMinn, Brian

Sent: Friday, September 23, 2016 1:28 PM

To: Thomas, Kent < thomas.kent@epa.gov; Guiseppi-Elie, Annette < Guiseppi-Elie, Annette Guiseppi-Elie, Annette Guiseppi-Elie, Annette Guiseppi-Elie, Annette@epa.gov Guiseppi-Elie, Annette@epa.gov The Annette@epa.gov The Annette@epa.gov Guiseppi-Elie, Annette@epa.gov Guiseppi-Elie, Annette@epa.gov Guiseppi-Annette@epa.gov <a href="mailto:Annette@epa.gov Guiseppi-Annette@epa.gov The Annette@epa.gov The Annette@ep

< Korajkic. Asja@epa.gov>

Cc: Oshima, Kevin < Oshima. Kevin@epa.gov >; Behymer, Thomas < Behymer. Thomas@epa.gov >

Subject: Re: TCRS - recycling plant sampling planning discussion

N em.	

Oct. 5th and 6th should work with our schedules. Please keep us informed if these dates change.

Thanks,

Brian and Asja

From: Thomas, Kent

Sent: Friday, September 23, 2016 1:03:59 PM

To: McMinn, Brian; Guiseppi-Elie, Annette; Korajkic, Asja

Cc: Oshima, Kevin; Behymer, Thomas

Subject: RE: TCRS - recycling plant sampling planning discussion

If you haven't selected preferred dates for let me propose:

Wednesday Oct. 5 - collect recycling plant samples, time TBD (Brian and Asja)

Thursday Oct. 6 – collect synthetic field samples as early in the morning as we can get in (Kent, Brian, and Asja).

This will allow us to ship the recycling plant sampling kits on Monday for Tuesday delivery to the plant. FYI – this plant owner is requiring collection of two sets of samples, one for us to analyze and one for us to hold in case they want another lab to analyze them in the future.

Of course, we will need to get signed agreement in place with the recycling plant owners and scheduling agreement from the plant and field owners/managers.

Kent

From: McMinn, Brian

Sent: Friday, September 23, 2016 12:32 PM

To: Thomas, Kent < thomas.kent@epa.gov; Guiseppi-Elie, Annette < Guiseppi-Elie, Annette Guiseppi-Elie, Annette Guiseppi-Elie, Annette Guiseppi-Elie, Annette Thomas.kent@epa.gov; Korajkic, Asja

<Korajkic.Asja@epa.gov>

Cc: Oshima, Kevin < Oshima. Kevin@epa.gov >; Behymer, Thomas < Behymer. Thomas@epa.gov >

Subject: Re: TCRS - recycling plant sampling planning discussion

All,

A quick update. We have booked our flights to [EL. 5 Personal Privacy (PP)] for Wed. the 28th of September. We have contacted [EL. 5 Personal Privacy (PP)] to relay our flight information to him; there seems to be ample time to collect and ship the samples without issue.

Kent, it should not be an issue to collect early morning samples of the fields, we'll plan on sampling over a two day visit. As soon as solid dates are chosen, we'll be in touch to organize the sampling schedules.

Thanks,

Brian and Asja

From: Thomas, Kent

Sent: Friday, September 23, 2016 12:03:27 PM

To: Guiseppi-Elie, Annette; Korajkic, Asja; McMinn, Brian Cc: Oshima, Kevin; Behymer, Thomas Subject: RE: TCRS - recycling plant sampling planning discussion Hi Asja and Brian: If the synthetic field owners agree to this, we prefer to collect samples at fields in the early morning (both to avoid field user conflicts and allow time to get the shipment out). This might suggest trying to schedule the synthetic field the day following the recyling plant sampling? Potentially, we could do both on the same day, but the organization's schedules might not let that occur. Kent From: Guiseppi-Elie, Annette Sent: Friday, September 23, 2016 11:33 AM To: Thomas, Kent < thomas.kent@epa.gov>; Korajkic, Asja < Korajkic.Asja@epa.gov>; McMinn, Brian <McMinn.Brian@epa.gov> Cc: Oshima, Kevin < Oshima. Kevin@epa.gov >; Behymer, Thomas < Behymer. Thomas@epa.gov > Subject: RE: TCRS - recycling plant sampling planning discussion Asja and Brian, Below is the proposed schedule for EPA sampling of fields and manufacturing plants: Sampling by EPA (some of the selections for EPA were made because they potentially are within driving distance from Sept. 27 Sept 28 Week of October 3 Ex. 6 Personal Privacy (PP) Week of October 3 TBD (Week of Oct 10) TBD (Week of Oct 10) **TBD**

Can you confirm with Kent via email (phones in RTP are not working) which 2 days (except Friday) in the week of Oct 3 would work best?

Also, per my discussion with Asja please then commit travel funds for ____ and other trips (Ex. 6 Personal Privacy (PP)

Let me know you need help. Thanks.

Best, Annette (mobile: Ex. 6 Personal Privacy (PP)

From: Thomas, Kent

Sent: Friday, September 23, 2016 8:02 AM

To: Korajkic, Asja < Korajkic. Asja@epa.gov>; Guiseppi-Elie, Annette < Guiseppi-Elie. Annette@epa.gov>; McMinn, Brian < McMinn. Brian@epa.gov>

Cc: Oshima, Kevin < Oshima. Kevin@epa.gov >; Behymer, Thomas < 8ehymer. Thomas@epa.gov >

Subject: RE: TCRS - recycling plant sampling planning discussion

Thanks, Asja and Brian. Nice job. We'll be looking for the samples here in RTP this morning.

I will work to get the sampling kit for shipped out Monday for arrival Tuesday at the plant, with shipped out Monday, Tuesday, and Wednesday. Karen Oliver here in RTP will be handling the sampling kit shipment.
Kent
From: Korajkic, Asja Sent: Friday, September 23, 2016 6:54 AM To: Thomas, Kent < <u>thomas.kent@epa.gov</u> >; Guiseppi-Elie, Annette < <u>Guiseppi-Elie.Annette@epa.gov</u> >; McMinn, Brian < <u>McMinn.Brian@epa.gov</u> > Cc: Oshima, Kevin < <u>Oshima.Kevin@epa.gov</u> >; Behymer, Thomas < <u>Behymer.Thomas@epa.gov</u> > Subject: RE: TCRS - recycling plant sampling planning discussion
Thank you Annette and Kent!
We have completed sampling at [F. 5 Personal Princy (PP)] plant yesterday as planned. Samples should be arriving today.
I'll make traveling arrangements for and contact before we arrive to confirm.
Asja
Asja Korajkic, Ph.D. Microbiologist U.S. Environmental Protection Agency Office of Research and Development National Exposure Research Laboratory 26 W. Martin Luther King Dr. Cincinnati, Ohio 45268 Ex. 6 Personal Privacy (PP)
From: Thomas, Kent Sent: Thursday, September 22, 2016 3:18 PM To: Guiseppi-Elie, Annette < Guiseppi-Elie. Annette@epa.gov>; Korajkic, Asja < Korajkic. Asja@epa.gov>; McMinn, Brian@epa.gov> Cc: Oshima, Kevin < Oshima. Kevin@epa.gov>; Behymer, Thomas < Behymer. Thomas@epa.gov> Subject: RE: TCRS - recycling plant sampling planning discussion
Thank you Annette.
We have a sampling kit prepared and we will plan on having it shipped directly to sept. 27. From your email I understand that he will be expecting the package.
Best wishes, Kent
From: Guiseppi-Elie, Annette

To: Korajkic, Asja < Korajkic. Asja@epa.gov>; Thomas, Kent < thomas.kent@epa.gov>; McMinn, Brian < McMinn.Brian@epa.gov> Cc: Oshima, Kevin < Oshima.Kevin@epa.gov>; Behymer, Thomas < Behymer.Thomas@epa.gov> Subject: RE: TCRS - recycling plant sampling planning discussion
Dear Asja and Brian, Your visit to the Ex. 8 Personal Privacy (PP) is confirmed for Wednesday September 28, 2016.
Ex. 6 Personal Privacy (PP)
Feel free (and I suggest that you do) to make contact with head of time as a courtesy and if you have any logistical questions.
Kent: s expecting to have the material shipped ahead of time.
Thanks everyone.
Best Regards, Annette.
Annette Guiseppi-Elie, Ph.D., FAIMBE Associate Director for Exposure Science NERL. USEPA/ORD Telephone: 919.541.4986 Mobile Ex. 6 Personal Privacy (PP) Email: guiseppi-elie.annette@epa.gov
From: Korajkic, Asja Sent: Tuesday, September 20, 2016 11:13 AM To: Thomas, Kent <thomas.kent@epa.gov>; McMinn, Brian <<u>McMinn.Brian@epa.gov</u>>; Guiseppi-Elie, Annette <<u>Guiseppi-Elie.Annette@epa.gov</u>> Cc: Oshima, Kevin <<u>Oshima.Kevin@epa.gov</u>>; Behymer, Thomas <<u>Behymer.Thomas@epa.gov</u>> Subject: RE: TCRS - recycling plant sampling planning discussion</thomas.kent@epa.gov>
Hi Kent, We have no problem with helping out in we can discuss further and coordinate once we have the written agreement in place.

Sent: Thursday, September 22, 2016 2:55 PM

We received the sampling kit and everything is pretty straight forward. We had one question regarding the "Sampling Collection Form", in particular "Production Process Type". Is this something our point of contact can help answer?

Thanks!

Asja and Brian

Asja Korajkic, Ph.D.

Microbiologist
U.S. Environmental Protection Agency
Office of Research and Development
National Exposure Research Laboratory
26 W. Martin Luther King Dr.
Cincinnati, Ohio 45268

Ex. 6 Personal Privacy (PP)

From: Thomas, Kent

Sent: Tuesday, September 20, 2016 10:56 AM

To: Korajkic, Asja < Korajkic. Asja@epa.gov>; McMinn, Brian < McMinn. Brian@epa.gov>; Guiseppi-Elie, Annette

<Guiseppi-Elie.Annette@epa.gov>

Cc: Oshima, Kevin < Oshima. Kevin@epa.gov>; Behymer, Thomas < Behymer. Thomas@epa.gov>

Subject: RE: TCRS - recycling plant sampling planning discussion

Asja and Brian:

Thanks very much. This is all positive information. Annette will be contacting the recycling plant to discuss scheduling and getting POC information.

Just a thought for the Ex.6 Personal Privacy (PP) plant, assuming we get the written agreement. We also have a signed agreement with an indoor synthetic turf field in Annette and I discussed the possibility of me going there and getting your help to collect samples at the field while there. Further discussion will be needed between us, and with ATSDR, to see if we want to try to do that.

Kent

From: Korajkic, Asja

Sent: Tuesday, September 20, 2016 8:41 AM

To: Thomas, Kent < thomas.kent@epa.gov; McMinn, Brian < McMinn, Brian < McMinn, Brian < McMinn, Brian@epa.gov; Guiseppi-Elie, Annette@epa.gov>

Cc: Oshima, Kevin < Oshima. Kevin@epa.gov >; Behymer, Thomas < Behymer. Thomas@epa.gov >

Subject: RE: TCRS - recycling plant sampling planning discussion

Hi Kent,

Thanks for the additional information and summary!

- 1. We have the contact info and are ready to go as planned this Thursday. We will identify the UPS location. We're waiting for the sampling kit and will let you know if we have any questions.
- 2. Proposed sampling date for plant: Wed. 28 likely between noon and 2 pm. If that works for the plant, please let us know and we'll make travel arrangements.
- We have just completed our Field HASP and it has been approved and signed.
- 4. We' re waiting for the written agreements. Likely sampling dates would be between 10/3 and 10/6.

Asja and Brian

Asja Korajkic, Ph.D.
Microbiologist
U.S. Environmental Protection Agency
Office of Research and Development
National Exposure Research Laboratory
26 W. Martin Luther King Dr.
Cincinnati, Ohio 45268

Ex. 6 Personal Privacy (PP)

From: Thomas, Kent

Sent: Monday, September 19, 2016 10:48 AM

To: Korajkic, Asja Korajkic,Asja@epa.gov; McMinn, Brian McMinn,Brian@epa.gov; Guiseppi-Elie, Annette

<<u>Guiseppi-Elie.Annette@epa.gov</u>>

Cc: Oshima, Kevin < Oshima. Kevin@epa.gov >; Behymer, Thomas < Behymer. Thomas@epa.gov >

Subject: RE: TCRS - recycling plant sampling planning discussion

Asja, Brian, and Kevin:

Thanks for the good discussion this morning and working towards scheduling recycling plant sampling visits.

1. We are trying to arrange a sampling visit for this Thursday (9/22) at the Ex. 5 Deliberative Process (DP). I contacted ATSDR this morning to see if we can get that scheduled for 1:00 pm on Thursday. I will try to get the sampling kit shipped to you in Cincinnati today for arrival tomorrow. I will get the POC and an address for the location from ATSDR and send that to you Ex. 6 Personal Privacy (PP)

Ex. 6 Personal Privacy (PP)

We will need to identify a UPS Store for shipping. Note that shipping deadlines for overnight air usually occur earlier in the day than store closing hours.

2. Asja and Brian will propose a sampling date, likely next week, for the Ex. 6 Personal Privacy (PP) The address is below. We will then confirm the date with the plant and get a POC for the plant. We will plan on shipping the sampling kit to the plant so it is ready for your use.

Ex. 6 Personal Privacy (PP)

Ex. 6 Personal Privacy (PP)

3.	I am attaching the field safety protocol that was approved by the RTP SHEM office for collecting samples at synthetic turf fields. You will check with Steve on whether this is sufficient, or whether something else is needed. I am also attaching the sample collection SOP I sent previously.
	<< File: hb2_long_form Thomas Synthetic Field 08-08-2016 DRAFT-Revised DW-AG-E-CSpdf >> << File: SOP D-EMMD-PHCB-038-SOP-01 Recycling Plant Approved.pdf >>
4.	Asja and Brian will propose sample collection dates for the Ex. 6 Personal Privacy (PP) addresses below. We have verbal agreement but have not received written agreement yet. ATSDR said they are likely to return the written agreement within the next couple of days. Ex. 6 Personal Privacy (PP)
	Ex. 6 Personal Privacy (PP)
5.	A reminder that our signed agreement with the plants says that we will not publicly release their names/identities. Plant names and locations should not be mentioned to anyone not directly working on this at EPA, and to no one outside of EPA.
6.	FYI: Here is the EPA web site with links to the Federal Research Action Plan and the Research Protocol.
	https://www.epa.gov/chemical-research/federal-research-recycled-tire-crumb-used-playing-fields Thanks everyone, Kent
	Original Appointment From: Thomas, Kent Sent: Wednesday, September 14, 2016 10:44 AM To: Thomas, Kent; Korajkic, Asja (Korajkic.Asja@epa.gov); McMinn, Brian (McMinn.Brian@epa.gov); Guiseppi-Elie, Annette (Guiseppi-Elie.Annette@epa.gov) Cc: Oshima, Kevin (Oshima.Kevin@epa.gov); Thomas Behymer; Timothy Buckley Subject: TCRS - recycling plant sampling planning discussion When: Monday, September 19, 2016 9:00 AM-10:00 AM (UTC-05:00) Eastern Time (US & Canada). Where: Ex. 6 Personal Privacy (PP)

Hi everyone:

I am trying to schedule a call to discuss TCRS recycling plant sampling. I know Friday may not the best day to do this. Let me know if it needs to be changed.

Thanks, Kent Thomas